

**CLAIMS**

1. A broadband line driver comprising an amplifying device (A) with an input and an output, and a transforming device (T) coupled in series with the 5 output of the amplifying device (A),

CHARACTERISED IN THAT the transforming device is located in a feedback loop that couples the output of the amplifying device (A) to the input of the amplifying device (A).

10 2. The broadband line driver according to claim 1,

CHARACTERISED IN THAT the transforming device (T) has a transformation ratio which is higher than 1:2.

15 3. The broadband line driver according to claim 1 or 2,

wherein a feedback circuit is connected between an output of the transforming device and the input of the amplifying device.

20 4. The broadband driver according to claim 3,

wherein the feedback circuit comprises resistors.

5. The broadband line driver according to any of the preceding claims, comprising:

- a first input terminal (IN1) and a second input terminal (IN2) as well as a first output terminal (OUT1) and a second output terminal (OUT2);

25 - the amplifying device (A) having a first and a second device input terminal (AI1, AI2) and a first and a second device output terminal (AO1, AO2),

- the transforming device comprising a transformer (T) with transformation ratio 1:n ( $n \geq 1$ ) and comprising a primary winding with a first terminal (T11) and a second terminal (T12) and a secondary winding with a first terminal (T21) and a second terminal (T22), the first device output terminal (AO1) being coupled to a first terminal (T11) of the primary winding of the transformer (T), and the second device output terminal (AO2) being coupled to

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the second terminal (T12) of the primary winding, the first terminal (T21) of the secondary winding being coupled to the first output terminal (OUT1), and the second terminal (T22) being coupled to the second output terminal (OUT2),

- a first resistor (R17) being connected between the second output terminal (OUT2) and the first device input terminal (AI1), and a second resistor (R18) being coupled between the first output terminal (OUT1) and the second device input terminal (AI2).

6. The broadband driver according to claim 5,

10 wherein:

- the first device input terminal (AI1) is coupled to the first input terminal (IN1) over a third resistor (R11),

- the second device input terminal (AI2) is coupled to the second input terminal (IN2) of the line driver over a fourth resistor (R12),

15 - a fifth resistor (R13) is connected between the first terminal (T12) of the secondary winding of the transformer (T) and the first output terminal (OUT1), and a sixth resistor (R14) is connected between the second terminal (T22) of the secondary winding of the transformer (T) and the second output terminal (OUT2),

20 - a seventh resistor (R15) is connected between the first terminal (T12) of the secondary winding of the transformer (T) and the first device input terminal (AI1) and a eighth resistor (R16) is connected between the second terminal (T22) of the secondary winding of the transformer (T) and the second device input terminal (AI2).

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7. The broadband line driver according to claim 6,

CHARACTERISED IN THAT the third resistor (R11) and the fourth resistor (R12) have substantially the same resistance value.

30 8. The broadband line driver according to any of claims 6 or 7,

CHARACTERISED IN THAT the fifth resistor (R13) and the sixth resistor (R14) have substantially the same resistance value.

9. The broadband line driver according to any of claims 6 to 8,  
5 CHARACTERISED IN THAT the seventh resistor (R15) and the eighth resistor (R16) have substantially the same resistance value.

10. The broadband line driver according to any of claims 5 to 9,  
CHARACTERISED IN THAT the first resistor (R17) and the second 10 resistor (R18) have substantially the same resistance value.

11. Digital subscriber line analogue front end comprising a broadband line driver according to any of the previous claims.

15 12. A method of operating a broadband line driver comprising an amplifying device, comprising the steps of:  
- transforming the output voltage of the amplifying device to a higher value;  
- feeding back a signal from the transformed output voltage to an input of  
20 the amplifying device.